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**Part C**

**Number of questions:** Three (03) essay questions

**Mark allocation:** 40

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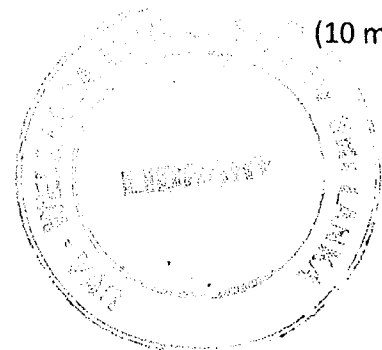
Question 1, 2 and 3 are based on the following scenario.

In a university, a common online English course is going to be offered for both undergraduate and postgraduate students. The course has several lessons to be completed by the students. A registered student can request a user account from the system administrator using the student registration number. Lecturers are provided a username and a password once they join with the university. The system administrator has the responsibility of managing the user accounts.

The lecturers can upload the learning materials for each lesson to the system and the students can download and use those materials. Evaluation of the course is divided into two stages; continuous assignments and final examination. For each evaluation, student registration number and the lecturer id have to be recorded other than the final result. Some continuous assignments are given as online quizzes which are designed by the lecturers and the students have to complete those quizzes at the end of each lesson. After completing a quiz, the students can check their mark if they want. Some of the continuous assignments are given as online report submissions and the deadlines for those assignments are set by the lecturer. The students can request for late submissions through the system and the lecturer can approve or reject the assignment according to the reason provided by the student. The mark of the continuous assignments have to be entered to the system by the lecturer. The final examination of the course is also an online examination and is going to be conducted at the university.

The lecturer finalizes the results using the system and the final grade of the course is displayed through the system only for the postgraduate students. The undergraduate students have to come to the university to check their results.

1. Use case diagrams help an analyst to understand the behavior of the system related to the users.
  - a. Explain the difference between 'include' and 'extend' in use case diagrams. (3 mark)
  - b. Student is one of the actors in the given scenario. List the other actors mentioned in the scenario. (2 mark)
  - c. Draw the use case diagram for the actor 'Student' by identifying the functionalities/use cases related to the student. (10 mark)



2. Class diagrams represent relationships between the classes.
- a. "Aggregation is a stronger form of composition". Do you agree with this statement? Justify your answer with a suitable example. (3 mark)
  - b. What are the classes that you can identify in the given scenario? (2 mark)
  - c. Draw the high-level class diagram using the identified classes. (*Hint: It is not mandatory to mention the attributes and methods in the classes.*) (10 mark)
3. Activity diagrams and sequence diagrams are the other main types of diagrams in UML.
- a. Draw the activity diagram for **online report submission** process. (5 mark)
  - b. Draw the sequence diagram for **user login** process. (5 mark)